the American S. S. *West Keats*, NW., 10, lowest pressure 29.02 inches, in 49° 50′ N., 166° W., on the 28th; and the British S. S. *Tahchee*, SSW., 9, lowest pressure 29.54 inches, in 45° 22′ N., 146° 20′ W. On the 30th the rough weather of the previous week showed signs of abatement.

Fog conditions, as drawn from ships' observations, indicate some slight clearing up since August. Scattered fog, however, occurred all along the northern routes, being particularly frequent to the westward of the 180th meridian. Between the 35th and 40th parallels, off the California coast, fog was reported on 9 days.

NOTE.

The American S. S. *Algonquin*, Capt. W. S. Harriman, Observer J. L. Patton, reports: "September 2, 8:30 p. m., latitude 14° 27′ N., longitude 95° 57′ W. A number of waterspouts to southward."

GALES ON THE SOUTH PACIFIC OCEAN.

By WILLIS E. HURD.

On the 7th and 8th of September, 1923, the British S. S. *Doonholm*, Capt. W. R. S. Branigan, experienced a southwest gale, force 7, lowest pressure 29.47 inches, in latitudes 43° 29′ S., to 42° S., longitudes 155° 20′ E. to 151° E., while on a voyage from Dunedin, New Zealand, toward Melbourne.

On the 8th and 9th of the month the British S. S. *Niagara*, Capt. J. T. Rolls, Sydney toward Auckland, experienced heavy squalls for several hours, near latitude 34° 50′ S., between longitudes 168° and 175° E. The highest force of the wind was 10 from the NE., on the 9th, lowest pressure 29.57 inches.

The British S. S. *Doonholm* again encountered a northwest to southwest storm in latitude 38° S., longitude 145° E., on the 20th. The highest wind force was SW. 10, lowest pressure 29.06.

EIGHT TYPHOONS IN THE FAR EAST DURING AUGUST, 1923.

By Rev. José CORONAS, S. J.

[Weather Bureau, Manila, P. I.]

There were no less than eight typhoons shown by our weather maps in the Far East during the month of August. Although only two of them traversed the Philippine Islands, yet several others influenced us a great deal in our weather, particularly with heavy rains and floods in the western part of Luzon. The monthly total rainfall for Manila and a few other stations of western Luzon, with the respective difference from the normal of August, will be of interest to our readers.

Stations.	Monthly total.	Difference from normal.
	mm.	*mm.*
Manila	1,147.6	+737.3
Iba	2,401.2	+1,326.8
Dagupan	1,189.3	+636.8
Baguio	2,378.7	+1,133.6
San Fernando Union	1,437.2	+705.1
Vigan	1,151.7	+432.8

The heaviest rains for 24 hours were those of Baguio, 533.4 mm.; San Fernando Union, 394.7 mm., and Iba, 288.7 mm. The heaviest daily rainfall for Manila was 197.4 mm.

The Babuyanes typhoon, August 3.—This typhoon was probably formed on July 29 to 30 to the east of southern Luzon, not far from 128° longitude E. and 13° or 14° latitude N. Its track was somewhat indefinite until 6 a. m. of August 2, when we could situate the center quite approximately in 125° longitude E., between 17° and 18° latitude N. Hence, it moved WNW., passing through the Babuyanes Islands about 40 miles to the north of Aparri in the afternoon of the 3d and entering China to the NE. of Hongkong in the afternoon of the 5th. The approxiate position of the center at 6 a. m. for the period August 3 to 5 was as follows:

August 3, 6 a. m., 122° 35′ longitude E.; 18° 50° latitude N.

August 4, 6 a. m., 118° 45′ longitude E.; 20° 30′ latitude N.

August 5, 6 a. m., 116° 00′ longitude E.; 22° 15′ latitude N.

The Loochoos and China typhoon, August 3 to 8.—This typhoon was first noticed in our weather maps in the afternoon of the 3d in about 138° longitude E. and 23° latitude N. It moved WNW. toward the Loochoos, the barometer at Naha having fallen at 6 p. m. of the 6th to about 722 mm. Between the Loochoos and China the typhoon inclined westward. The approximate position of the center at 6 a. m. of the 6th to 8th was:

August 6, 6 a. m., 129° 40′ longitude E.; 25° 30′ latitude N.

August 7, 6 a. m., 125° 00′ longitude E.; 27° 20′ latitude N.

August 8, 6 a. m., 119° 15′ longtitude E.; 26° 55′ latitude N.

The Meiacosima and China typhoon, August 8 to 11.—The first part of the track of this typhoon is somewhat uncertain, although it probably formed on August 3 to 4 south of Guam near 145° longitude E. and 10° latitude N., moving northwestward until August 6 and then westward on the 7th and part of the 8th. The center can easily be situated in our weather map of the 8th, 6 a. m., near 130° longitude E., between 18° and 19° latitude N.; and at 6 a. m. of the 9th in about 127° longitude E., between 20° and 21° latitude N. The typhoon was moving then NNW. and so it struck the Meiacosima group of islands about 150 miles east of northern Formosa on the 10th. The station of Ishigakihima reported at 6 a. m. of that day a barometer as low as 722.5 mm. with hurricane winds from the N. From Meiacosima the typhoon inclined northwestward and entered China in the morning of the 11th between 27° and 28° latitude N. Once in China it moved again NNW., gradually recurving to the NE. on the 12th, and traversed Manchuria on the 13th.

The Batanes and Hongkong typhoon, August 17 and 18.—The first part of this typhoon is somewhat uncertain and indefinite, although we are inclined to believe that it is the same as was shown in our weather map at 2 p. m. of the 11th to the SSW. of Guam in about 143° longitude E. and 11° latitude N. If this be the case, we have to suppose that after moving NNW. from the 11th to the 13th, it inclined decidedly to the W. on the 13th and 14th. The center was clearly situated at 6 a. m. of the 16th, between 20° and 21° latitude N. and in about 127° longitude E. It was moving almost due W.

at a rate of near 13 miles per hour. The steamer *Steel Traveler* met the center of this typhoon in 123° 20′ longitude E. and 21° 00′ latitude N., the barometer having fallen on board to 711.2 mm. (28 inches), not corrected for gravity, at 8 p. m. of the 16th and two hours of calm having been observed with a steady barometer. Our observer at Basco (121° 59′ longitude E. and 20° 28′ latitude N.) reported by wireless to this office a barometric minimum as low as 714.50 mm., not corrected for gravity, recorded at 3 a. m. of the 17th with a whole gale backing from NNW. to SW. and S., thus confirming the direction of the typhoon and its rate of progress as given above. As the calm observed on board the *Steel Traveler* lasted for two hours, we suppose that the real center of the typhoon passed over her at about 9 p. m., and hence the rate of progress of the typhoon between this steamer and Basco was about 13.5 miles per hour.

The typhoon after passing near to the north of Basco continued moving westward, increasing its rate of progress to an average of about 15 miles per hour, threatening the English colony of Hongkong. Although proper and timely warnings had been given since August 17, the storm was a great calamity for Hongkong, it being considered the worst experienced there for the last 15 years. And if not for the extraordinary rate of progress of the typhoon the havoc wrought there would have been even much greater. The lowest barometric minimum was 28.66 inches (727.95 mm.); it was recorded at 10 a. m. of the 18th. The highest wind squall velocity registered during the typhoon was 130 miles an hour at 10:13 a. m. of the same day. The center passed near to the south of Hongkong. There were at least four vessels sunk, among them the *Loonsang* and twenty driven ashore. The losses of lives were considerable both afloat and ashore.

The typhoon of the Loochoos and Korea, August 22 to 28.—The first part of this typhoon up to the 22d is still somewhat uncertain with the few observations we have on hand. At 6 a. m. of the 22d the center was situated near 131° longitude E. and 27° latitude N. moving WNW. The center passed near to the south of Oshima on the same day and recurved northeastward on the 24th about 200 miles to the west of Shanghai. It traversed Korea on the 25th and the Sea of Japan on the 26th moving NE.

Other four less important typhoons.—The first of them appeared to the south of Guam on the 15th near 144° longitude E. and 11° latitude N. It moved for a short time NW., then N., and finally E., traversing in this direction the northern part of the Ladrone Islands on the 17th.

The second typhoon formed on the 19th to 20th over the China Sea NW. of Luzon in about 118° longitude E. and 19° latitude N. It moved almost due W., traversing Hainan in the afternoon of the 22d.

The third typhoon appeared also in the China Sea on the 26th in about 116° longitude E., between 19° and 20° latitude N., and moved NNW., passing about 50 miles to the east of Hongkong in the afternoon of the 27th.

The last typhoon of the month appeared almost simultaneously with the preceding one in the Pacific to the SE. of the Loochoos in about 130° longitude E., between 21° and 22° latitude N. It passed through the Loochoos as a depression of little importance in the afternoon of the 27th, but it developed into a real typhoon in the Eastern Sea while recurving northeastward. It moved very slowly, and reached the southwestern part of Japan during the night of August 30 to 31.

DETAILS OF THE WEATHER IN THE UNITED STATES.

GENERAL CONDITIONS.

ALFRED J. HENRY.

The outstanding features seem to have been (1) a movement of anticyclones across the Lake region and down the St. Lawrence Valley, and as a consequence a very substantial increase in pressure from the average level of the preceding month; (2) temperature mostly above the normal; (3) greater than normal precipitation in the majority of States. The usual details follow.

CYCLONES AND ANTICYCLONES.

By W. P. DAY.

Four disturbances formed within the area between Bermuda and the West Indies and three of these displayed the characteristic central core of the tropical hurricane. However, the only one that could be said to be of tropical origin developed just north of Haiti on the 25th, and though it followed a more or less normal path, it was very much retarded during its recurve by high pressure to the northward, the storm finally moving northeastward with considerable acceleration when released by falling pressure to the northward. Another disturbance developed hurricane characteristics on the 5th when about 300 miles northeast of Bermuda. There were some indications of this disturbance as a depression north of the Lesser Antilles during the last day or so of August. It was followed with more or less uncertainty as it recurved around Bermuda and was first noted as a storm on the 5th, as previously stated. At this time further movement was stopped by rising pressure to the north and northeast and the storm after remaining nearly stationary for two days turned northward with increasing speed as the air-pressure began to fall in that direction.

After this storm passed out of the field of observation northeast of Newfoundland, unsettled conditions continued over the area of the Gulf Stream and by the morning of the 12th another storm, extremely small but very intense, was noted about 250 miles north of Bermuda. This storm moved rapidly northeast to southeastern Newfoundland, having enlarged its area and diminished in intensity upon leaving the warm waters of the Gulf Stream. Full hurricane velocities were reported by vessels encountering this small disturbance.

A fourth disturbance developed to the northeast of the Bahamas on the 14th and 15th of the month, enlarged its area rapidly and took on the characteristics of the extra-tropical counter-current LOW.

The continental low-pressure areas were generally unimportant and normal both in number and type.

The number of high-pressure areas showed an increase over the preceding month, but HIGHS No. VII and VIII were the only ones to cause any marked depressions in temperature.